

5 Claims:

1. A method for screening a compound that is able to suppress aberrant immune activity, the method comprising the steps of:

(a) administering a compound to be screened to a non-human transgenic

10 animal that has been modified to express human Fc_YRIIa receptor such that the transgenic animal is susceptible to an autoimmune disease; and

(b) assessing the transgenic animal to determine if the compound reduces aberrant immune activity in the animal.

2. A method for screening a compound that is able to suppress an autoimmune disease, the method comprising the steps of:

(a) administering a compound to be screened to a non-human transgenic animal that has been modified to express human Fc_YRIIa receptor such that the transgenic animal is susceptible to an autoimmune disease; and

20 (b) assessing the transgenic animal to determine if the compound reduces aberrant immune activity in the animal.

3. A method for screening a compound that is able to suppress an autoimmune disease, the method comprising the steps of:

(a) administering a compound to be screened to a non-human cell expressing human Fc_YRIIa receptor, wherein the cell is derived from a non-human transgenic animal that has been modified to express human Fc_YRIIa receptor such that the transgenic animal is susceptible to an autoimmune disease; and

25 (b) assessing the cell to determine if the compound reduces aberrant immune activity in the cell.

4. A method according to any one of claims 1 to 3, wherein the compound reduces aberrant immune activity selected from the group consisting of aberrant immune complex formation, aberrant immune complex clearance and immune complex induced inflammation.

30 5. A method according to claim 1 or 2, wherein the method includes the additional step of:

35 (c) assessing the transgenic animal to determine if the compound reduces immune complex induced inflammation.

6. A method according to any one of claims 1 to 5, wherein the non-human transgenic animal is resistant to collagen-induced arthritis prior to being modified to express the human Fc_YRIIa receptor.

- 5 7. A method according to any one of claims 1 to 6, wherein the non-human
transgenic animal is a transgenic mouse derived from the strains C57BL/6 and SJL
that has been modified to express human Fc γ RIIa receptor.
- 10 8. A method according to any one of claims 1 to 7, wherein the compound
reduces aberrant immune activity in the animal by inhibiting the activity of Fc γ RIIa
expressed in the animal.
- 15 9. A method according to any one of claims 1, 2 and 4 to 8, wherein in step (b) the
aberrant immune activity is assessed in terms of clinical symptoms and / or
pathological features of an autoimmune disease.
- 20 10. A method according to any one of claims 1 to 9, wherein the autoimmune
disease is selected from the group consisting of arthritis and systemic lupus
erythematosus (SLE).
- 25 11. A method according to any one of claims 1 to 10, wherein the autoimmune
disease is rheumatoid arthritis (RA).
- 30 12. A method according to any one of claims 1 to 10, wherein the autoimmune
disease is collagen-induced arthritis (CIA).
- 35 13. A compound that can reduce aberrant immune activity in a cell or animal
when identified by the method according to any one of claims 1 to 12.
- 40 14. A method of treating or preventing an autoimmune disease in a subject, the
method comprising administering an effective amount of a compound that can reduce
45 aberrant immune activity in the subject, wherein the compound is identified by the
method according to any one of claims 1 to 12.
- 50 15. A method according to claim 14, wherein the compound can reduce aberrant
immune complex formation, aberrant immune complex clearance or immune complex
induced inflammation in a subject.
- 55 16. A method according to claim 14, wherein the compound can reduce aberrant
immune activity in the cell by inhibiting the activity of Fc γ RIIa expressed in the
subject.
- 60 17. A method according to any one of claims 14 to 16, wherein the autoimmune
disease is caused by aberrant immune complex formation, aberrant immune complex
65 clearance or immune complex induced inflammation.
- 70 18. A method according to any one of claims 14 to 17, wherein the autoimmune
disease is selected from the group consisting of arthritis and systemic lupus
erythematosus (SLE).

- 5 19. A method according to any one of claims 14 to 18, wherein the autoimmune
disease is rheumatoid arthritis (RA).
20. A method according any one of claims 14 to 18, wherein the autoimmune
disease is collagen-induced arthritis (CIA).
21. A composition for treating or preventing an autoimmune disease, the
10 composition comprising an effective amount of a compound that can reduce aberrant
immune activity in an animal, and a pharmaceutically acceptable diluent, excipient or
carrier, wherein the compound is identified by the method according to any one of
claims 1 to 12.
22. A composition according to claim 21, wherein the compound can reduce
15 aberrant immune complex formation, aberrant immune complex clearance or immune
complex induced inflammation in an animal.
23. A composition according to claim 21 or 22 , wherein the compound can reduce
aberrant immune activity in the animal by inhibiting the activity of Fc γ RIIa expressed
in a cell of the animal.
- 20 24. A composition according to any one of claims 21 to 23, wherein the
autoimmune disease is caused by aberrant immune complex formation, aberrant
immune complex clearance or immune complex induced inflammation.
25. A composition according to any one of claims 21 to 24, wherein the
autoimmune disease is selected from the group consisting of arthritis and systemic
lupus erythematosus (SLE).
26. A composition according to any one of claims 21 to 25, wherein the
autoimmune disease is rheumatoid arthritis (RA).
27. A composition according any one of claims 21 to 25, wherein the autoimmune
disease is collagen-induced arthritis (CIA).
- 30 28. A non-human transgenic animal that has been modified to express human
Fc γ RIIa receptor such that the transgenic animal is susceptible to an autoimmune
disease, wherein the transgenic animal is resistant to collagen-induced arthritis prior
to being modified to express the human Fc γ RIIa receptor.
29. A non-human transgenic animal according to claim 28, wherein the transgenic
35 animal is a mouse.
30. A non-human transgenic animal according to claim 29, wherein the transgenic
derived from the strains C57BL/6 and SJL that has been modified to express human
Fc γ RIIa receptor.

- 5 31. A non-human transgenic animal according to any one of claims 28 to 30,
wherein the autoimmune disease is caused by aberrant immune complex formation,
aberrant immune complex clearance or immune complex induced inflammation.
- 10 32. A non-human transgenic animal according to any one of claims 28 to 31,
wherein the autoimmune disease is selected from the group consisting of arthritis and
systemic lupus erythematosus (SLE).
- 15 33. A non-human transgenic animal according to any one of claims 28 to 32,
wherein the autoimmune disease is rheumatoid arthritis (RA).
- 20 34. A non-human transgenic animal according to any one of claims 28 to 33,
wherein the autoimmune disease is collagen-induced arthritis (CIA).
- 25 35. A method of producing a non-human transgenic animal model for
autoimmune disease, the method comprising the steps of:
- (a) introducing a nucleic acid molecule encoding human Fc_YRIIa receptor
to a cell of a non-human embryo;
 - (b) transferring the embryo to a foster mother; and
 - (c) assessing the resultant born animal for susceptibility to autoimmune
disease;
- 20 wherein the non-human transgenic embryo is resistant to collagen-induced arthritis
prior to the introduction of a nucleic acid molecule encoding a human Fc_YRIIa
receptor.
- 25 36. A method according to claim 35, wherein the transgenic animal is a mouse.
- 30 37. A method according to claim 35 or 36, wherein the transgenic animal is a
transgenic mouse derived from the strains C57BL/6 and SJL that has been modified to
express human Fc_YRIIa receptor.
- 35 38. A method according to any one of claims 35 to 37, wherein the autoimmune
disease is caused by aberrant immune complex formation, immune complex clearance
or immune complex induced inflammation.
- 40 39. A method according to any one of claims 35 to 38, wherein the autoimmune
disease is selected from the group consisting of arthritis and systemic lupus
erythematosus (SLE).
- 45 40. A method according to any one of claims 35 to 39, wherein the autoimmune
disease is rheumatoid arthritis (RA).
- 50 41. A method according to any one of claims 35 to 39, wherein the autoimmune
disease is collagen-induced arthritis (CIA).

- 5 42. A method for producing a composition for treating or preventing an
autoimmune disease, the method comprising
- 10 (a) selecting the compound by the method according to any one of claims 1
to 12; and
- (b) formulating the compound with a pharmaceutically acceptable diluent,
excipient or carrier to produce the composition.